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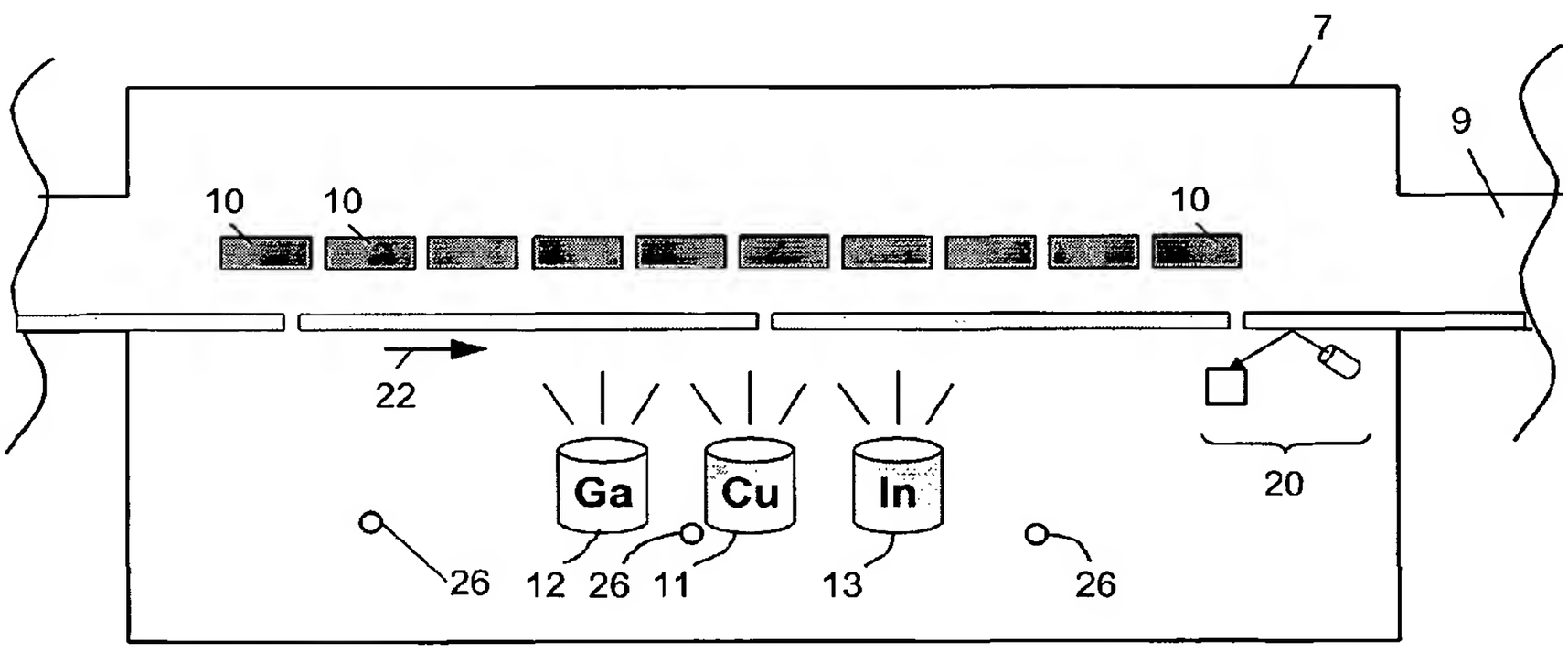
(54) **Title:** METHOD AND APPARATUS FOR IN-LINE PROCESS CONTROL OF THE CIGS PROCESS



(57) **Abstract:** An in-line production apparatus and a method for composition control of copper indium gallium diselenide (CIGS) solar cells fabricated by a co-evaporation deposition process is described. The deposition conditions are so that an deposited Cu-excessive overall composition is transformed into to a Cu-deficient overall composition, the final CIGS film. Substrates (21) with a molybdenum layer move through the CIGS process chamber (7) with constant speed. The transition from copper rich to copper deficient composition on a substrate is detected by using sensors which detect a physical parameter related to the transition, for example emission. In the alternative preferred embodiment of the invention sensors (20) are provided that detect the composition of elements in the deposited layer. A controller (17) connected to the sensors adjusts the fluxes from the evaporant sources (11, 12, 13) in order provide a CIGS layer with uniform composition and uniform thickness over the width of the substrate. The use of two rows of evaporant sources allows adjustment of the elemental composition and the thickness of the CIGS layer over the width of the substrate.

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